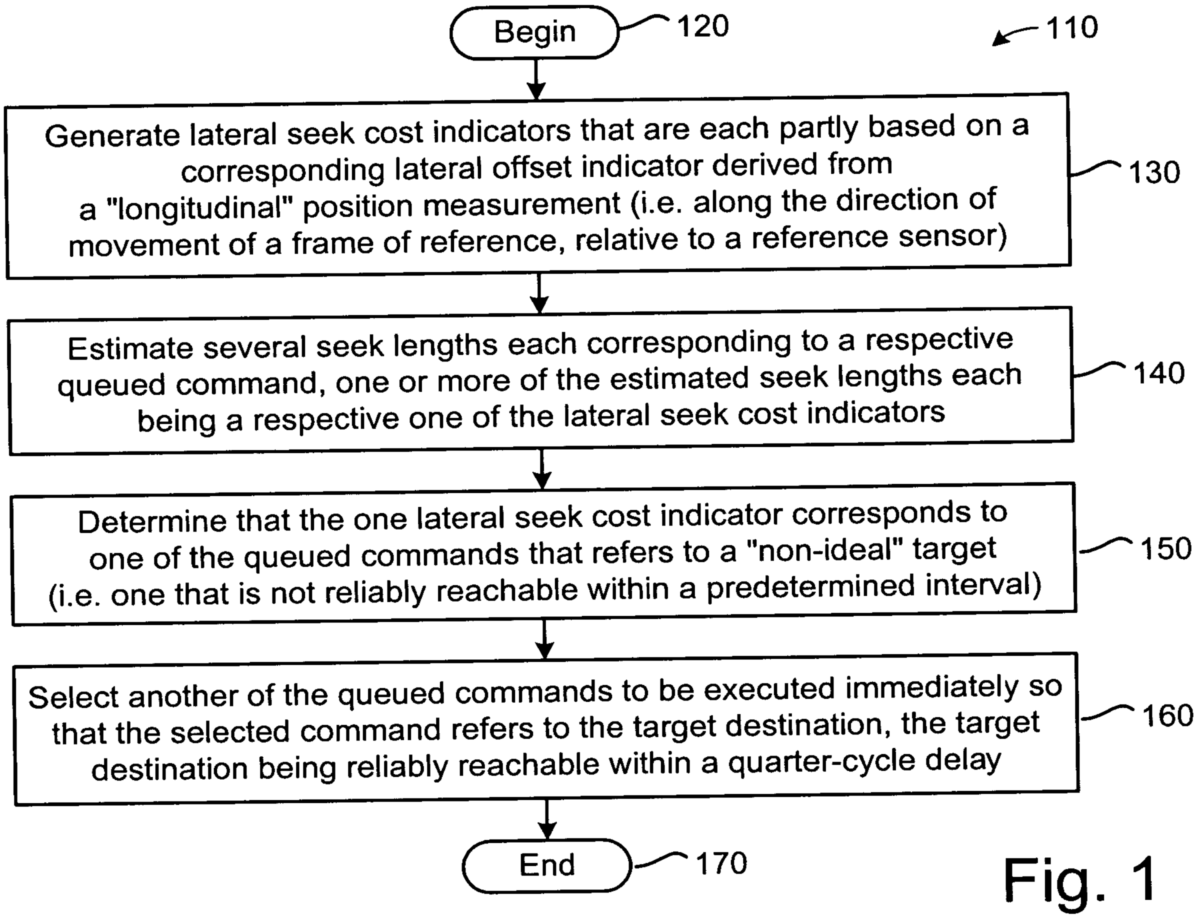


Generate lateral seek cost indicators that are each partly based on a corresponding lateral offset indicator derived from a "longitudinal" position measurement (i.e. along the direction of movement of a frame of reference, relative to a reference sensor)

Estimate several seek lengths each corresponding to a respective queued command, one or more of the estimated seek lengths each being a respective one of the lateral seek cost indicators

Determine that the one lateral seek cost indicator corresponds to one of the queued commands that refers to a "non-ideal" target (i.e. one that is not reliably reachable within a predetermined interval)

Select another of the queued commands to be executed immediately so that the selected command refers to the target destination, the target destination being reliably reachable within a quarter-cycle delay

Fig. 1

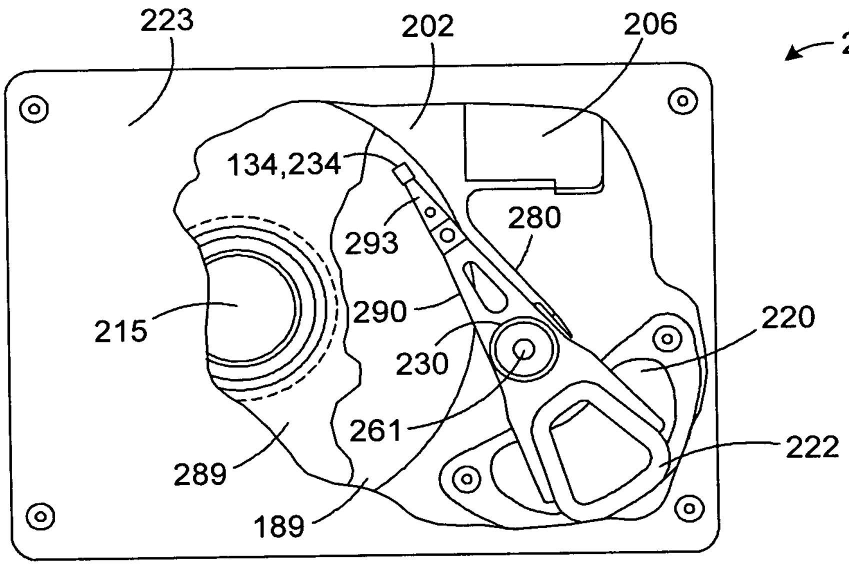


Fig. 2

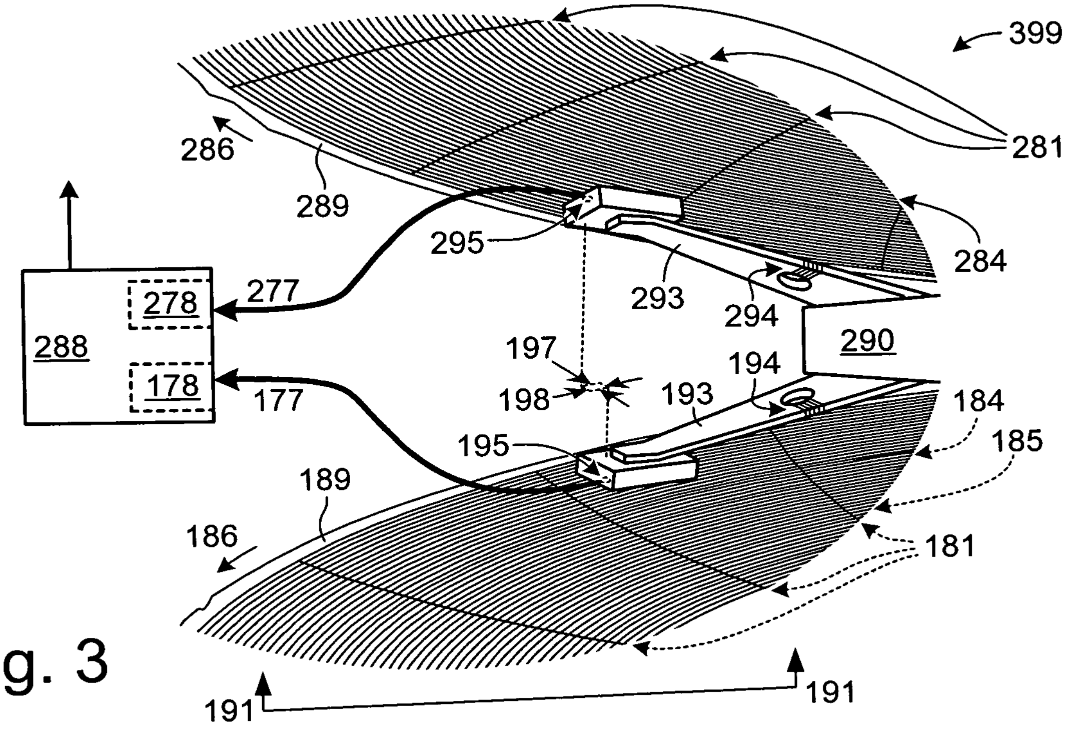

399
281
286
289
284
295
278
277
288
293
294
290
178
177
197
198
193
194
184
185
195
189
186
181
191
191

Fig. 3

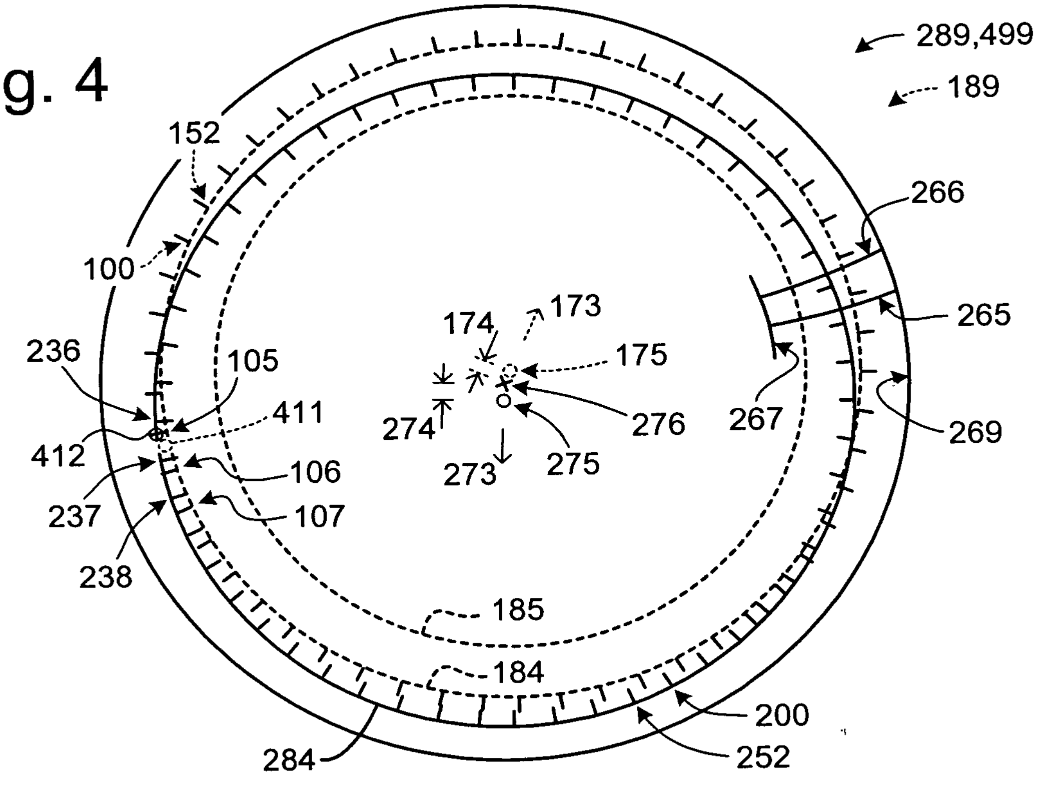

289,499
189
152
266
100
265
174
173
175
236
105
274
276
267
269
411
412
275
106
273
237
107
238
185
184
200
284
252

Fig. 4

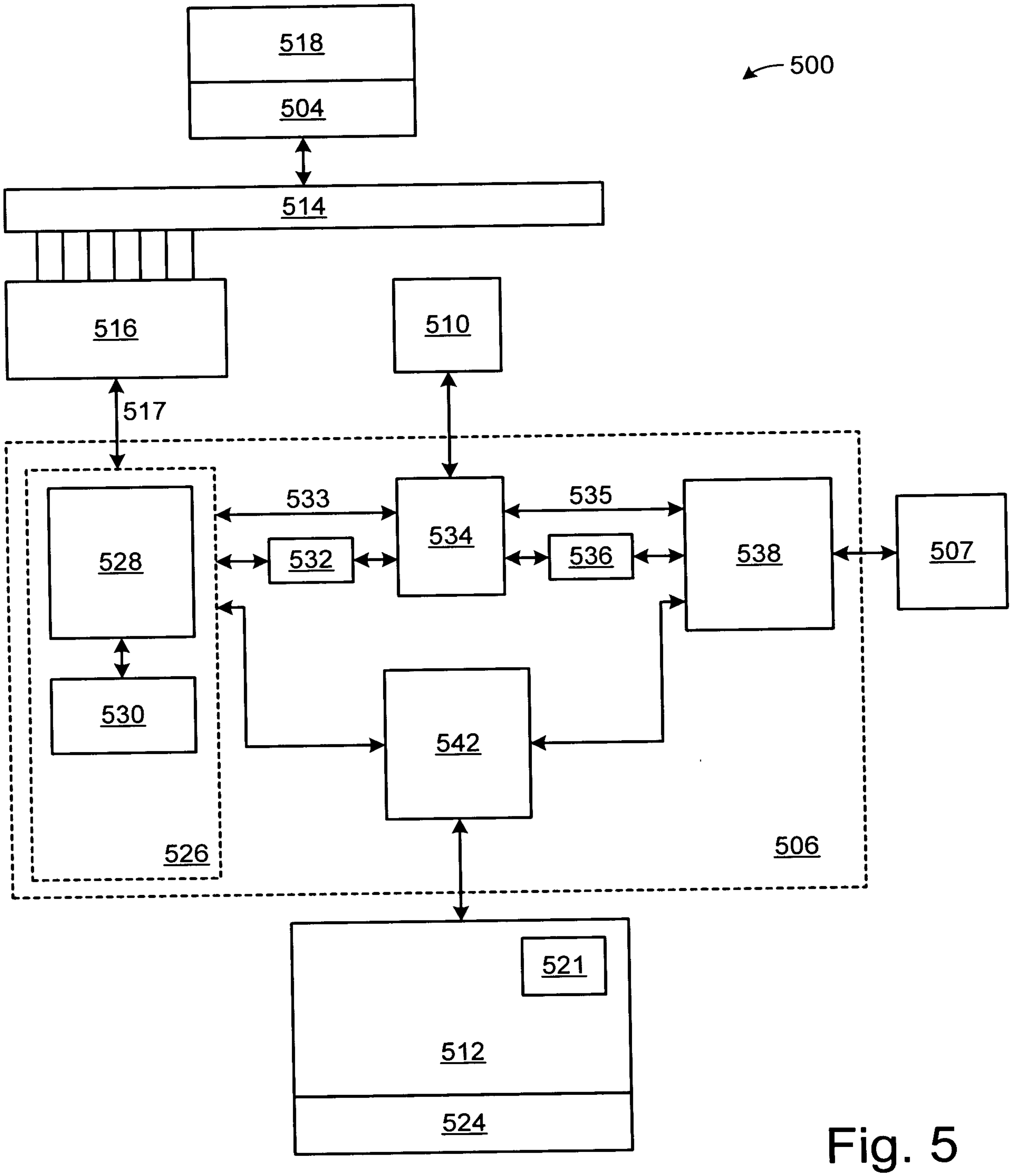

500
518
504
514
516
517
510
533
534
535
538
507
528
532
536
530
542
526
506
521
512
524

Fig. 5

Fig. 6

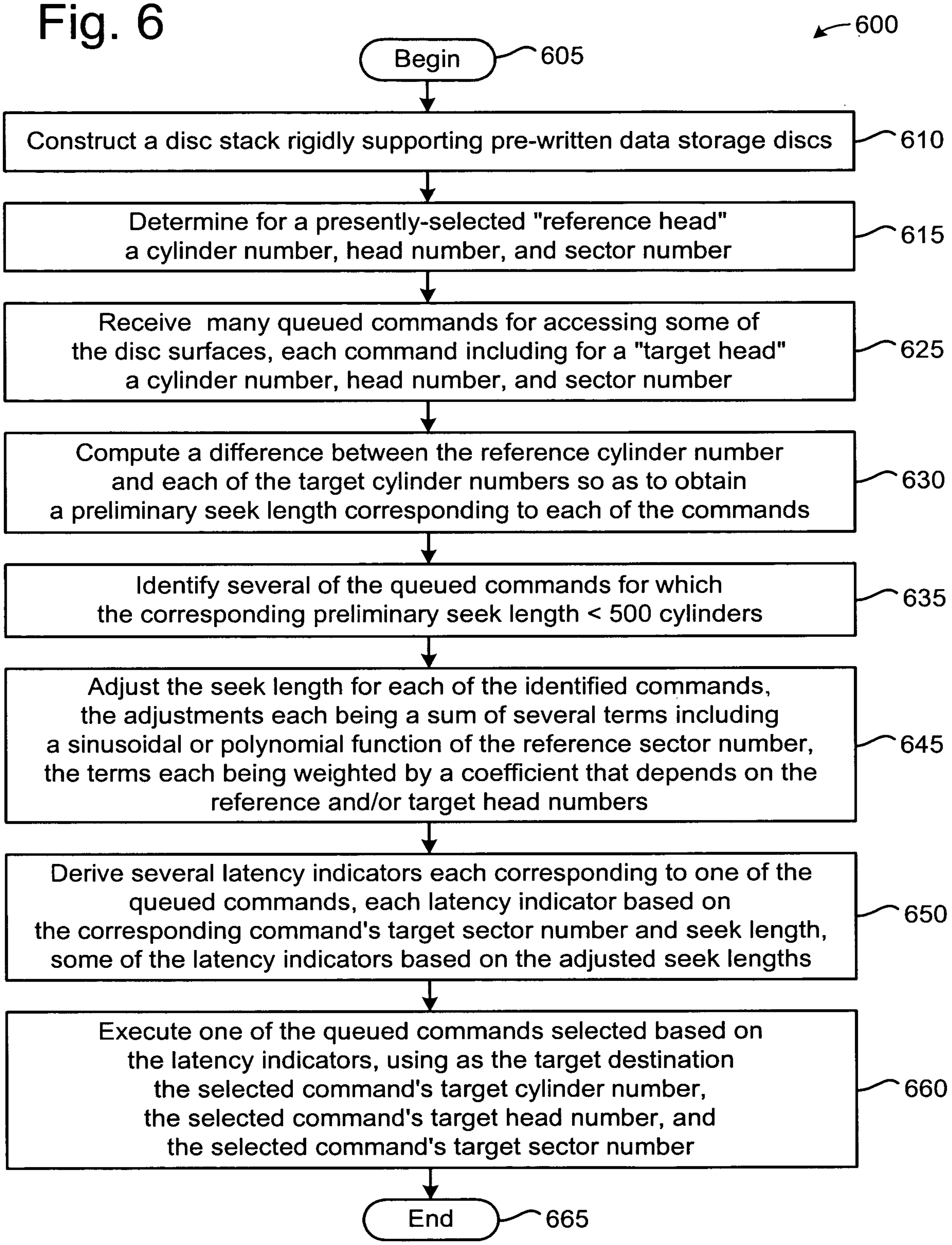
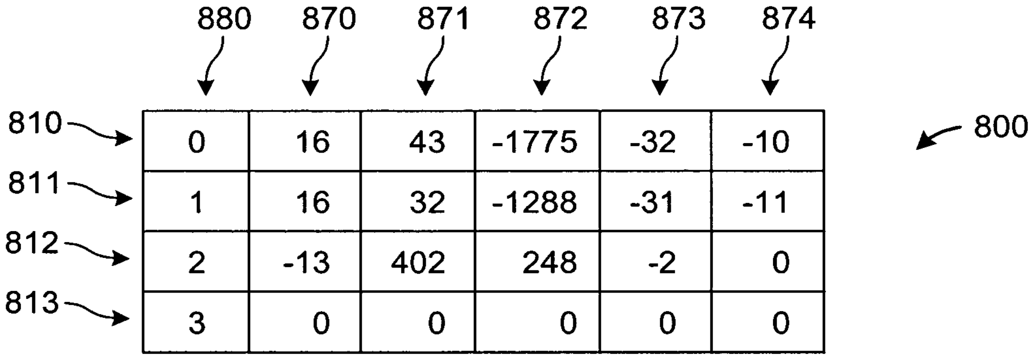

600
Begin
605
Construct a disc stack rigidly supporting pre-written data storage discs
610
Determine for a presently-selected "reference head" a cylinder number, head number, and sector number
615
Receive many queued commands for accessing some of the disc surfaces, each command including for a "target head" a cylinder number, head number, and sector number
625
Compute a difference between the reference cylinder number and each of the target cylinder numbers so as to obtain a preliminary seek length corresponding to each of the commands
630
Identify several of the queued commands for which the corresponding preliminary seek length < 500 cylinders
635
Adjust the seek length for each of the identified commands, the adjustments each being a sum of several terms including a sinusoidal or polynomial function of the reference sector number, the terms each being weighted by a coefficient that depends on the reference and/or target head numbers
645
Derive several latency indicators each corresponding to one of the queued commands, each latency indicator based on the corresponding command's target sector number and seek length, some of the latency indicators based on the adjusted seek lengths
650
Execute one of the queued commands selected based on the latency indicators, using as the target destination the selected command's target cylinder number, the selected command's target head number, and the selected command's target sector number
660
End
665

Fig. 7

700

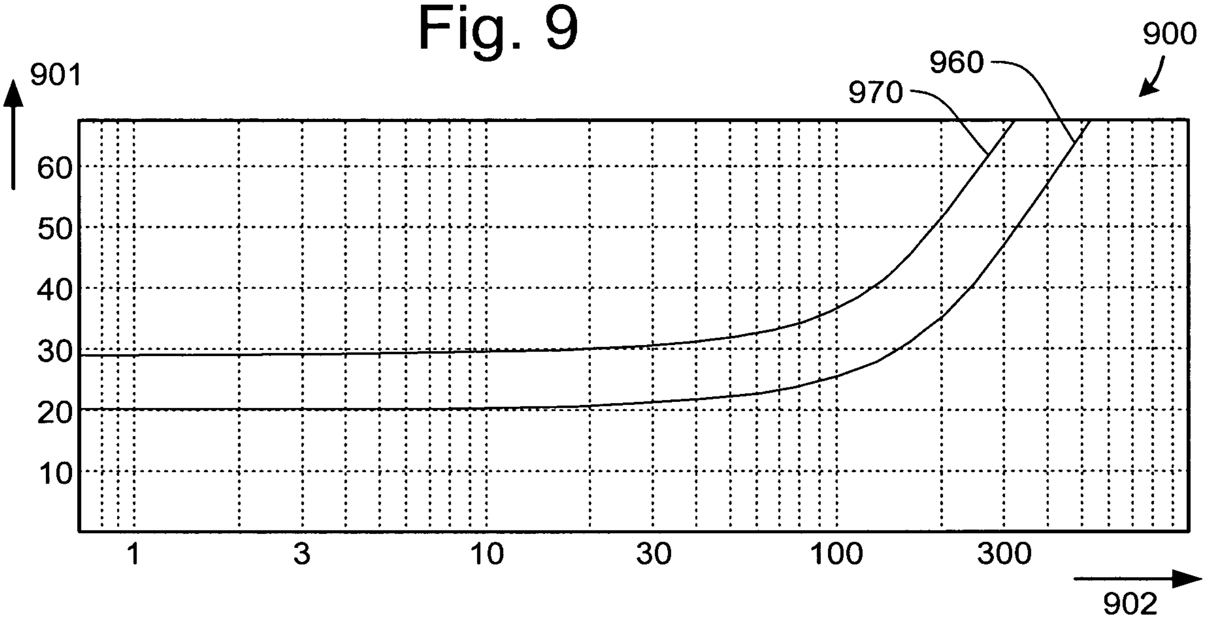
```
//  Function:   sa_EvalDeltaS ()
//  Parameters:  S_Head, D_Head, StartSector, SrcCyl
//  Return:    Adjustment to be added to the preliminary seek length
//=================================================================
//              EffectiveDistance = DestCyl + DeltaL(Dest) - SrcCyl - DeltaL(Src)
//                                = DestCyl + DeltaS(Dest,Src) - SrcCyl
//                 DeltaL(Location) = c0(h) + c1(h)*NormalizedSrcCyl>>15
//                                      + c2(h)*(NormalizedSrcCyl^2)>>30
//                         + c3(h)*sine(StartingSector) + c4(h)*cosine(StartingSector)
//                  DeltaS(Dest,Src)  = DeltaL(Dest) - DeltaL(Src)
//                       = c0(D_Head) - c0(S_Head)
//                        + (c1(D_Head) - c1(S_Head)) * NormalizedSrcCyl>>15
//                        + (c2(D_Head) + c2(S_Head)) * (NormalizedSrcCyl^2)>>30
//                        + (c3(D_Head) - c3(S_Head)) * sine(StartingSector)>>15
//                        + (c4(D_Head) - c4(S_Head)) * cosine(StartingSector)>>15
//
//    pd_Opr_ai16Q15SineTable(x) = round(32767*sine(x*2*Pi/SECTORS_PER_REV))
//=================================================================
int16 sa_EvalDeltaS (uint16 S_Head, uint16 D_Head, uint16 u16_Sector, int32 i32_Cyl)
{
 static int32 i32_DeltaL =0;    // output before final RightShift
 #define  C0_SHIFT   15
             // RightShift for total to convert to integer tracks (=15+Qvalue of DC terms))
 #define  C1_SHIFT   4
             // RightShift for cylinder input, selected so that:
             //        (Max_Cyl  >>C1_SHIFT)  is between 8K and 32K.

i32_DeltaL = ((int32)(Table.i16_DeltaS[D_Head][4] - Table.i16_DeltaS[S_Head][4])
          * (int32)pd_Opr_ai16Q15SineTable[u16_Sector+SECTORS_PER_REV/4 ]) ;

i32_DeltaL +=((Table.i16_DeltaS[D_Head][3] - Table.i16_DeltaS[S_Head][3])
          * (int32)pd_Opr_ai16Q15SineTable[u16_Sector]) ;

i32_DeltaL +=((Table.i16_DeltaS[D_Head][2] - Table.i16_DeltaS[S_Head][2])
          * (i32_Cyl >> C1_SHIFT)*((i32_Cyl >> C1_SHIFT)>>C0_SHIFT) ) ;

i32_DeltaL +=((Table.i16_DeltaS[D_Head][1] - Table.i16_DeltaS[S_Head][1])
          * (i32_Cyl  >> C1_SHIFT)) ;

i32_DeltaL +=(Table.i16_DeltaS[D_Head][0] - Table.i16_DeltaS[S_Head][0])
          << C0_SHIFT;                    // could also add this term after final shift

 return  (int16)  ((i32_DeltaL  + (1<<(C0_SHIFT-1)  ))>>  C0_SHIFT);
      // round off and shift to q0.
}
```

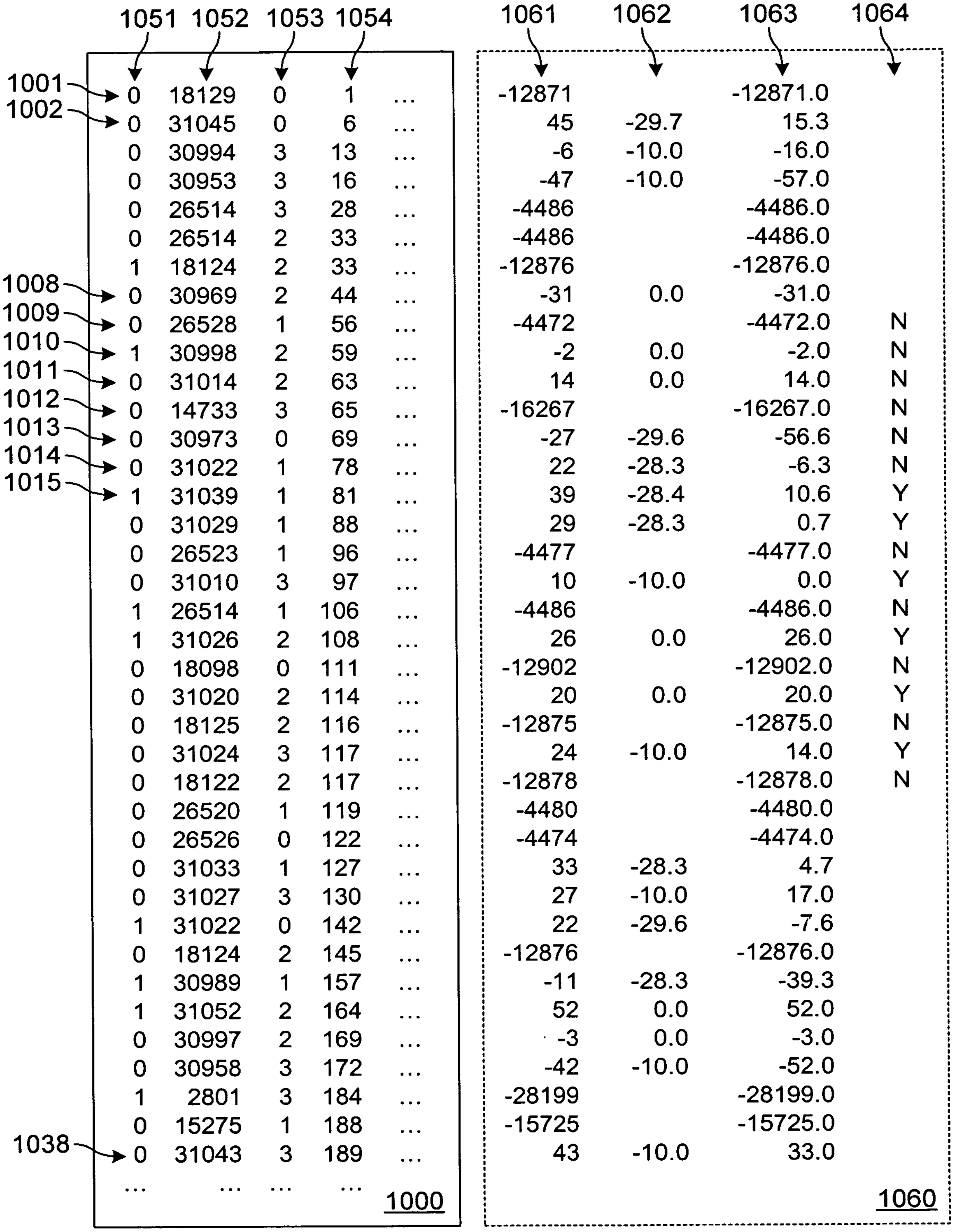


	880	870	871	872	873	874
810	0	16	43	-1775	-32	-10
811	1	16	32	-1288	-31	-11
812	2	-13	402	248	-2	0
813	3	0	0	0	0	0

Fig. 8

Fig. 9





	1051	1052	1053	1054	
1001	0	18129	0	1	…
1002	0	31045	0	6	…
	0	30994	3	13	…
	0	30953	3	16	…
	0	26514	3	28	…
	0	26514	2	33	…
	1	18124	2	33	…
1008	0	30969	2	44	…
1009	0	26528	1	56	…
1010	1	30998	2	59	…
1011	0	31014	2	63	…
1012	0	14733	3	65	…
1013	0	30973	0	69	…
1014	0	31022	1	78	…
1015	1	31039	1	81	…
	0	31029	1	88	…
	0	26523	1	96	…
	0	31010	3	97	…
	1	26514	1	106	…
	1	31026	2	108	…
	0	18098	0	111	…
	0	31020	2	114	…
	0	18125	2	116	…
	0	31024	3	117	…
	0	18122	2	117	…
	0	26520	1	119	…
	0	26526	0	122	…
	0	31033	1	127	…
	0	31027	3	130	…
	1	31022	0	142	…
	0	18124	2	145	…
	1	30989	1	157	…
	1	31052	2	164	…
	0	30997	2	169	…
	0	30958	3	172	…
	1	2801	3	184	…
	0	15275	1	188	…
1038	0	31043	3	189	…
	…	…	…	…	

1000

1061	1062	1063	1064
-12871		-12871.0	
45	-29.7	15.3	
-6	-10.0	-16.0	
-47	-10.0	-57.0	
-4486		-4486.0	
-4486		-4486.0	
-12876		-12876.0	
-31	0.0	-31.0	
-4472		-4472.0	N
-2	0.0	-2.0	N
14	0.0	14.0	N
-16267		-16267.0	N
-27	-29.6	-56.6	N
22	-28.3	-6.3	N
39	-28.4	10.6	Y
29	-28.3	0.7	Y
-4477		-4477.0	N
10	-10.0	0.0	Y
-4486		-4486.0	N
26	0.0	26.0	Y
-12902		-12902.0	N
20	0.0	20.0	Y
-12875		-12875.0	N
24	-10.0	14.0	Y
-12878		-12878.0	N
-4480		-4480.0	
-4474		-4474.0	
33	-28.3	4.7	
27	-10.0	17.0	
22	-29.6	-7.6	
-12876		-12876.0	
-11	-28.3	-39.3	
52	0.0	52.0	
-3	0.0	-3.0	
-42	-10.0	-52.0	
-28199		-28199.0	
-15725		-15725.0	
43	-10.0	33.0	

1060

Fig. 10